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## SEQUENCE LISTING

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<120> Novel Bacterial RNase P Proteins and  
Their Use in Identifying Antibacterial Compounds

<130> 50093/016001

<140> US 09/516,051

<141> 2000-03-01

<160> 95

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 417

<212> DNA

<213> Streptococcus mutans

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ggacgaagtg ttgccaatcg gaaatttggt gtctatagtt tagaaaaaga tcaaagtcac 180  
tatcgtgttg gactttcagt tggaaaaaga ttaggaaatg ctgtcgttag aaatgcgatt 240  
aaacgaaaat tgcgccatgt cttatggaa cttggtcctt atttaggcac tcaagatttt 300  
gttggtattg ctagaaaagg tgttgaggaa cttgattata gcacgatgaa aaaaaatctg 360  
gttcattgtt taaaactggc taaactgtat caggaaggat ctattcgtga aaaagaa 417

<210> 2

<211> 477

<212> DNA

<213> Klebsiella pneumoniae

<400> 2

cgctcgtcgtg ctaaaggcgg cgctcgtctg accgtttcca agtaataaag ctaaccctgc 60  
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gtcttccagc agccacaacg ggctggcagc ccgcaaatca ccatcctcgg ccgcctgaat 180  
tcgctggggc atccccgcac cggctctacc gtggccaaga aaaacgtgaa acgcgcacat 240  
gaacgcaatc ggattaaacg tctgacgcgt gaaagttttc gtttgctgca acatgaactc 300  
ccgccaatgg atttcgtggt ggtggcgaaa agaggggttg ccgacctgca taaccgtgct 360  
ctctcggaag cgttggaata attatggcgc cgccattgtc gcttggtcgc cgggtcctga 420  
tcggcctgat tcgagtttat cagcgcctga ttagtcgcgt actcgggccc cattgtc 477

<210> 3

<211> 455

<212> DNA

<213> Salmonella paratyphi

<400> 3

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gttacgtttg ttaactcccg ctcatattcac attcgtcttc cagcaacctc aacgggctgc 120  
 acgccgcaaa taccatccct cggccgctg aattcgtctg ggcatccccg tateggctctt 180  
 accgtcgcca agaaaaatgt tcgacgtgcg catgaacgca accggattaa acgtctgacg 240  
 cgtgaaagct tccgtctgcg ccagcatgaa ctctctgcaa tggatttcgt ggtgggtggcg 300  
 aaaaaagggg ttgccgacct cgataaccgt gctctctcgg aagcgttggg aaaattatgg 360  
 cgccgccact gtcccttggc tcgcggtgct tgatagccct tattcgggtc tatcaacgcc 420  
 tgatcagtcg gctgcttggg ccgcattgtc gtttc 455

<210> 4  
 <211> 528  
 <212> DNA  
 <213> Pseudomonas aeruginosa

<400> 4  
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 gtggtgagtc gggacttcga cggggacaag cgtctactga cagcccggca attcagcgca 120  
 gtcttcgact ctccgaccgg caaggtcccc ggcaagcagc tctgtctgct ggcgcgcgag 180  
 aacgggtctcg atcaccctcg cctgggctcg gtgactcgga agaagaacgt caagctcgcc 240  
 gtccagcgca atcgctctca acgcctgac cgcaatcgt tccgccataa ccaggaaacc 300  
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 gagctgcacc agcagttcgg caagctctgg aaacgcctgt tgcgcaatcg acctcgcacg 420  
 gaaagccctg ctgacgcccc tggcgtggcc gacggtactc atgcataggt cgatgcccgc 480  
 gcatcccgat ccctgtagtg tcatccccc ttcgatgacc cggcaccg 528

<210> 5  
 <211> 510  
 <212> DNA  
 <213> Corynebacterium diphtheriae

<400> 5  
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 gtcactctta caagctcgaa tagaacgac gtgctacctt cacagcacia gctcagcaat 120  
 tccgaacagt tccgcgcaac gattcggaa ggcaagcgtg ctgggaggag caccgtcgtt 180  
 cttcattttt atgctgaggg gaccgcgggc aaccttgcaa ccgcaggcgg cccgcgattc 240  
 ggctcgtttg tgtccaaggc tgttggaat gctgtgactc gtcaccgtgt ttcgcggcag 300  
 ttaaggcagc tagtaatcgc tatgaaagac cagttcccag cgtcatccca tgttgttgtg 360  
 agggcgatac cgccagcggc gacagcaagt tatgaggagt tgcgggcaga tgtgcaggca 420  
 gcaactcgaca agctcaaccg caagcgataa ggcggttact cgccctcgtg ggttggttag 480  
 tcgcgcattg tttgatgcgg tgcggttcta 510

<210> 6  
 <211> 504  
 <212> DNA  
 <213> Chlamydia trachomatis

<400> 6  
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 attgatctct aagatctttc atttgtgcat cggttaactc tacctaaaag tgcccgccta 120  
 ttgaaacgta aacaatttgt ttacgtgcag cgttggtggc aatattgtcg tactgatcag 180  
 gcaactttac gaatagttcc ttctcgtcat tcgaacatcc gtaaagtagg ggttactgtt 240  
 tctaaaaaat ttgggaaagc ccatcagcgc aatcgtctta aaagaattgt gcgagaggct 300  
 tttaggcatg tgcgacaaa tcttcccgca tgtcaagtgg tagtgtctcc taaagggggc 360  
 actctaccaa attttggtta actatccgcg gatcttctta agcatattcc agaggctttg 420  
 cctctcgtta ctctctctaa gtagtttttt attttggtca aaaaataaaa aaccattcca 480  
 cgctatagag gcatggaatg ggaa 504

<210> 7  
 <211> 492  
 <212> DNA

Sul  
C1  
cont  
B10  
Cont

<213> *Vibrio cholerae*

<400> 7

ggcagcgtgg gccgataagt ggactaataa accactggta aagttttaca ataccaatgg 60  
ctaaccacga gaagggcgag agaggcggtg ccatagtttg ccaagcaagt taaacagttc 120  
ttcattgctc aaatcttgcg cgctcttttt ggcgatgaca acaaaatctt tgttagccag 180  
ttgattttga tgtaagcgaa agctttctct gcaaatacgt ttgaatcgat tacggccgac 240  
ggcagttttg atctgctttt taggaaccgc gagtcccaa cgaggatgag aaaggttatt 300  
agcgcgagcg atgattgtga gatgaggaga accagcactg tgagcttgct ggaagacttt 360  
ttgataatgt tcgggagtta acaaacgtaa ctcccgattg aatgcgtacg tactcaaaat 420  
aattcgagat tattttgaca ggcgcttacg gccttttgca cgacgtgcat tcagaacttt 480  
acgacggttc gc 492

<210> 8

<211> 492

<212> DNA

<213> *Neisseria gonorrhoea*

<400> 8

atgttccttg tatgggaaac ccgttgccgt ctgaaccttg cctgcagggt accgtttctga 60  
tcataacctgt ttcccgcatc cggttgccgg gttgccgaac atgagttgtg ccagttccgc 120  
ccttgccctgt tttgcggtag ccctgtcgaa ttccggcgcg acgcgcacga cgaaatcctg 180  
aggcggcagc cggtttttgt tcaatctgaa ccagtcgcgg atgacgcgtt tcatatagtt 240  
ccgctcgttg gcgcgttttg cggttttttt gccgaccacc agaccgatgc ggggatggtc 300  
cagcccggtt cggtttgagc gcgaaacttg cagcaggtcg cggctgcggc gggttctgaa 360  
tgcaaaaacg gatgaaaaat catccgtttt taacaagcgg tactgccttc cgaagcggtg 420  
gtccaaaatt acactgccag gcgtttgcgg cttttggcac ggctgcggc caatactgcg 480  
cgtccgcccgc gt 492

<210> 9

<211> 492

<212> DNA

<213> *Neisseria meningitidis*

<400> 9

tggttccttag tatgggaaac ccgttgccgt ctgaaccttg cctgcagagt accgtttctga 60  
tcatgcctgt ttctgcacac cggttgccgg gttgccgaac atgagttgtg ccagttccgc 120  
ccttgccctgt tttgcggtag ccctgtcgaa ttacggcgcg acgcgcacga cgaaatcctg 180  
cggcggcagc cggtttttgt tcaatctgaa ccagtcgcgg atgacgcgct tcatataatt 240  
tcgttcgttg gcgcgttttg cggttttttt gccgaccacc agaccgatgc ggggatgatc 300  
cagcccggtt cggtttgaa cgcgaaacttg cagcaggtcg cggctgcggc gggttctgaa 360  
tgcaaaaacg gatgaaaaat catccgtttt caacaagcgg tactgccttc cgaagcggtg 420  
gtccaaaatt acaccgccag gcgtttgcgg cttttggcgc gccgtgcggc caatactgcg 480  
cgtccgcccgc gc 492

<210> 10

<211> 462

<212> DNA

<213> *Streptococcus pyogenes*

<400> 10

gttacctcac cagcaccaca ggccactaat aatagaacta aggggactat tcttgcaatt 60  
ttaatgtttt tcttactctt caaaaccttt ctcaagcaat tctgctaact ttaaaacatg 120  
atgtaaaatt tggtgaagct cttgatactc caaagattcg acacccttac gggcaatcac 180  
cacgaaatcc tctgacttca gctgatgcc taatgccatg ataactgac gtatctttcg 240  
tttgactgca tttctggtga ctgcatttcc tattttttta ccgacagaaa taccacacg 300  
gaagtggctc tggcctctat ttaaataata aatgacaaat tttcgatttg ctgtactttt 360  
tccatcctta aatatggctt ggaaatcttt ctcacgcttg acacgatagg tcttcttcaa 420  
aatttaactc caatatctaa attattacca ttataccaca tc 462

<210> 11  
<211> 492  
<212> DNA  
<213> Bordetella pertussis

<400> 11  
ccacccaggg gctgaggaag taccggtaaa accggatcgg ggcgataagc agtctcctga 60  
tcatcgcgct atccgtgtga agtgagcacc tacttcggcg cgcgccgagc gtttcagggc 120  
cgtgaggcct gccgggtgtca gcttgctgtg cagcgcgacc acgtaatcct gggccggcag 180  
ggcaagccgg cagagcccgga acgcttcgcg gatgacccgc ttcaaggatg tgcgcgtcac 240  
ggcgcggggc gcaaaacgct tggcgatcac caggcccagg cgcgcgcgcg ccggctggtc 300  
atcagcaggg gcacagggcg aggcgctgac aataaagaaa gccctcggg ccagtcgccg 360  
gcctttgagg gcggcggcaa actcggaggg gcgatgcaat cgcgcctccg cagggagcgt 420  
ggcgcgcggc atgggtgacg tgacggagac tggcgacggg gccggcggcg atgctcctgt 480  
tacaggcaat cc 492

<210> 12  
<211> 534  
<212> DNA  
<213> Porphyromonas gingivalis

<400> 12  
agaagaaaaat ggggagcagt aagagttgca cgagaaaage cttgatcagt cgcacgtat 60  
ttactcgttt ttcaaagccg atgaaggtag atttcggga attctgatca gactcttttg 120  
catcgtcttc tccactgtac gaaagtcagg aagttcatcc gatactacca taaatgcaat 180  
agtagcatag atctgtctct cttggaggac atcgttcagg aggtgtttgt tgagccgata 240  
agcctccctg accaaacgct tgacccattt gcgcttcacg gctcgcctaa accttttctt 300  
tgctacgctt accagcatgg aggaatatgc aactcgatgc tccgatccca gacggtagac 360  
tacgcgtaga ggataaacga caaaagcctt gccttcgcca aagaccgtat tgatttcac 420  
gcgaagatag aggcgttcgc ttttgatag gccgaatgta ggcggagagg tcatctccc 480  
ttgaggtaat cctctaattg catagccata gaaggatatt gctcggtcgg cgca 534

<210> 13  
<211> 495  
<212> DNA  
<213> Streptococcus pneumoniae

<400> 13  
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ctagtcaact ttagtttctt tttcactccc atttccttcc cggtaaactt ttgataattt 120  
taatacatgg agtagatttt tctccatctc tgcgtatccc aaggtttcga ctctttttcg 180  
agcaattgaca acaaagtcga catcttctac cagactccct tttgcattct ggataatatg 240  
ccgaatccgt cgcttaattt gattttctagt gacggcattc cccagttttt tgctaactga 300  
tagacctact cgaaaacggt ttttctggtt ttctaattgg tagaccacaa atttgcgatt 360  
agcaaaactt gtccctctct tgaaaatcgc cttaaatctt ttctctcttt ttacacgaaa 420  
gtttttcttc aaaactcaac tccatctatt aaattactac tattatacca tatttttcaa 480  
aaaagccaat catag 495

<210> 14  
<211> 465  
<212> DNA  
<213> Clostridium difficile

<400> 14  
tcctttaata tataaattat tttattcaaa gtcattaacc tccatattta tagcatacaa 60  
ttaaatagaa atatccgttc ttttaactaa attttttata gacttgctta tgtctttaaa 120  
agtagcatcc ttactagata cccttgctat aaatactata tcatatccag gcttaatttt 180  
ttcatcaata tttaatctgt aggttctttt tattaatctt ctactctat tcctagtaat 240  
agcttttctt actttttttg aaacagaaat acctactcta ctataatctg atttattttt 300

aagtatatat attactaaat atttgtttgc aaaagatttg ccgtgtttat atacttttct 360  
 aaaatcagag tcttttttca acccttttagt cctattaaag tccatagtta acctccataa 420  
 acacagctat gaatcgtaat tatttacaca aaaaggccac ctttg 465

<210> 15  
 <211> 447  
 <212> DNA  
 <213> Camphylobacter jejuni

<400> 15  
 aagcagcggg ttttaaaggg ctttaagaatt tctgataaaa acggagtatt tttaggcata 60  
 tcatttgaaa cattctagtt ttttcaatcc ccattttaga tttttttcta acctagaaaa 120  
 agaaagttca gtgatttcat ttttagctac aaaaatatat ttgccatctt gaagatatct 180  
 ttcaaactta gcaaacaag ctcttaaaat tcgttttgaa cgattttctaa ccactgcttt 240  
 tccaactttt ttactagcaa caactgctat ttttttttca taactattca gataaaaaat 300  
 gatcacacct tcgcaatgcc attttttgcc tactttatat acagatgaaa attcctcgtt 360  
 tgtgctaaat ttatcaaat ttttcacaca gcaagtcctt ttctaccttt agcgcgtctt 420  
 gcattgatca ctttgcgacc attttta 447

<210> 16  
 <211> 480  
 <212> DNA  
 <213> Baccillus anthracis

<400> 16  
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 tcatttccctt acgtactttt ttattctttt cataccagag cgtttaaaga catgaattaa 120  
 gcttttcttt aattcttcat atgtcatctc tgcacaaggc ttcttgcta ttataacaaa 180  
 atcttttcca gaatctatct catcttttaa ttctgtgat gactggcgaa tcatacgttt 240  
 aattcggtta cgcactactg catttcttat cttcttgctg acagaaaggc caatacgaaa 300  
 gtttggetgc tcttctttat ctagtgtgata gacaacaaat tgacgatcgc cattcgattt 360  
 tcctttttga aaaaccgtct ggaattcctc attctttttt atacgatgtt ttttcttcat 420  
 atcaattgac actcctgtag ttcattcagc gaaattcact attattagaa aaaaagacca 480

<210> 17  
 <211> 480  
 <212> DNA  
 <213> Mycobacterium avium

<400> 17  
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 cgccgacgac gcggtccggc ttccgggcag cgcgcgaatc accagccggt cggatgggtc 180  
 gagttcgccg agcagggccc gggccacgtg acgcagccgc cgggccacgc ggtgtcgttg 240  
 caccgcgcgc ccgacggcct tcccagacac cagcccgacc cgtgggcccg cggattcgtc 300  
 gtcgggttcg gagtcgcgcg ggaggtggac gacgatgtcg ggctgcgcca tgcgggttcc 360  
 gtgcttcacc gtcgcgtcaa actcgggtga ccgcgtcatg cggttgcgtg cgggaagcac 420  
 cgcgaaagac ctgacgtgcg atcaggcaga gacgcgcg cgacccttgc ggcccgacc 480

<210> 18  
 <211> 474  
 <212> DNA  
 <213> Staphylococcus aureus

<400> 18  
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aaaggtcatt ctgtagccaa cagacaattt gttgtataca cttgtaataa taaagaaata 180  
gaccattttc gcttaggtat tagtgtttct aaaaaactag gtaatgcagt gttaagaaac 240  
aagattaaaa gagcaatagc tgaaaatttc aaagtacata agtcgcatat attggccaaa 300  
gatattattg taatagcaag acagccagct aaagatatga cgactttaca aatacagaat 360  
agtcttgagc acgtacttaa aattgccaaa gtttttaata aaaagattaa gtaaggatag 420  
ggtaggggaa ggaaaacatt aaccactcaa cacatcccga agtcttacct caga 474

<210> 19  
<211> 474  
<212> DNA  
<213> Staphylococcus aureus

<400> 19  
gttataagct caatagaagt ttaaatatag cttcaaataa aaacgataaa taagcgagt 60  
atgttattgg aaaaagctta ccgaattaaa agaattgcag attttcagag aatatataaa 120  
aaaggtcatt ctgtagccaa cagacaattt gttgtataca cttgtaataa taaagaaata 180  
gaccattttc gcttaggtat tagtgtttct aaaaaactag gtaatgcagt gttaagaaac 240  
aagattaaaa gagcaatagc tgaaaatttc aaagtacata agtcgcatat attggccaaa 300  
gatattattg taatagcaag acagccagct aaagatatga cgactttaca aatacagaat 360  
agtcttgagc acgtacttaa aattgccaaa gtttttaata aaaagattaa gtaaggatag 420  
ggtaggggaa ggaaaacatt aaccactcaa cacatcccga agtcttacct caga 474

<210> 20  
<211> 119  
<212> PRT  
<213> Streptococcus mutans

<400> 20  
Val Leu Lys Lys Ala Tyr Arg Val Lys Ser Asp Lys Asp Phe Gln Ala  
1 5 10 15  
Ile Phe Thr Glu Gly Arg Ser Val Ala Asn Arg Lys Phe Val Val Tyr  
20 25 30  
Ser Leu Glu Lys Asp Gln Ser His Tyr Arg Val Gly Leu Ser Val Gly  
35 40 45  
Lys Arg Leu Gly Asn Ala Val Val Arg Asn Ala Ile Lys Arg Lys Leu  
50 55 60  
Arg His Val Leu Met Glu Leu Gly Pro Tyr Leu Gly Thr Gln Asp Phe  
65 70 75 80  
Val Val Ile Ala Arg Lys Gly Val Glu Leu Asp Tyr Ser Thr Met  
85 90 95  
Lys Lys Asn Leu Val His Val Leu Lys Leu Ala Lys Leu Tyr Gln Glu  
100 105 110  
Gly Ser Ile Arg Glu Lys Glu  
115

<210> 21  
<211> 119  
<212> PRT  
<213> Klebsiella pneumoniae

<400> 21  
Val Val Lys Leu Ala Phe Pro Arg Glu Leu Arg Leu Leu Thr Pro Ser  
1 5 10 15  
His Phe Thr Phe Val Phe Gln Gln Pro Gln Arg Ala Gly Thr Pro Gln  
20 25 30  
Ile Thr Ile Leu Gly Arg Leu Asn Ser Leu Gly His Pro Arg Ile Gly  
35 40 45  
Leu Thr Val Ala Lys Lys Asn Val Lys Arg Ala His Glu Arg Asn Arg

50 55 60  
 Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu  
 65 70 75 80  
 Pro Pro Met Asp Phe Val Val Val Ala Lys Arg Gly Val Ala Asp Leu  
 85 90 95  
 Asp Asn Arg Ala Leu Ser Glu Ala Leu Glu Lys Leu Trp Arg Arg His  
 100 105 110  
 Cys Arg Leu Ala Arg Gly Ser  
 115

<210> 22  
 <211> 110  
 <212> PRT  
 <213> Salmonella paratyphi

<400> 22  
 Val Thr Phe Val Asn Ser Arg Ser Phe His Ile Arg Leu Pro Ala Thr  
 1 5 10 15  
 Ser Thr Gly Cys Thr Pro Gln Ile Thr Ile Leu Gly Arg Leu Asn Ser  
 20 25 30  
 Leu Gly His Pro Arg Ile Gly Leu Thr Val Ala Lys Lys Asn Val Arg  
 35 40 45  
 Arg Ala His Glu Arg Asn Arg Ile Lys Arg Leu Thr Arg Glu Ser Phe  
 50 55 60  
 Arg Leu Arg Gln His Glu Leu Pro Ala Met Asp Phe Val Val Val Ala  
 65 70 75 80  
 Lys Lys Gly Val Ala Asp Leu Asp Asn Arg Ala Leu Ser Glu Ala Leu  
 85 90 95  
 Glu Lys Leu Trp Arg Arg His Cys Arg Leu Ala Arg Gly Ser  
 100 105 110

<210> 23  
 <211> 135  
 <212> PRT  
 <213> Pseudomonas aeruginosa

<400> 23  
 Val Val Ser Arg Asp Phe Asp Arg Asp Lys Arg Leu Leu Thr Ala Arg  
 1 5 10 15  
 Gln Phe Ser Ala Val Phe Asp Ser Pro Thr Gly Lys Val Pro Gly Lys  
 20 25 30  
 His Val Leu Leu Leu Ala Arg Glu Asn Gly Leu Asp His Pro Arg Leu  
 35 40 45  
 Gly Leu Val Ile Gly Lys Lys Asn Val Lys Leu Ala Val Gln Arg Asn  
 50 55 60  
 Arg Leu Lys Arg Leu Ile Arg Glu Ser Phe Arg His Asn Gln Glu Thr  
 65 70 75 80  
 Leu Ala Gly Trp Asp Ile Val Val Ile Ala Arg Lys Gly Leu Gly Glu  
 85 90 95  
 Leu Glu Asn Pro Glu Leu His Gln Gln Phe Gly Lys Leu Trp Lys Arg  
 100 105 110  
 Leu Leu Arg Asn Arg Pro Arg Thr Glu Ser Pro Ala Asp Ala Pro Gly  
 115 120 125  
 Val Ala Asp Gly Thr His Ala  
 130 135

<210> 24  
<211> 129  
<212> PRT  
<213> Corynebacterium diphtheriae

<400> 24  
Val Thr Leu Thr Ser Ser Asn Arg Thr Thr Val Leu Pro Ser Gln His  
1 5 10 15  
Lys Leu Ser Asn Ser Glu Gln Phe Arg Ala Thr Ile Arg Lys Gly Lys  
20 25 30  
Arg Ala Gly Arg Ser Thr Val Val Leu His Phe Tyr Ala Glu Ala Thr  
35 40 45  
Ala Gly Asn Leu Ala Thr Ala Gly Gly Pro Arg Phe Gly Leu Val Val  
50 55 60  
Ser Lys Ala Val Gly Asn Ala Val Thr Arg His Arg Val Ser Arg Gln  
65 70 75 80  
Leu Arg His Val Val Ile Ala Met Lys Asp Gln Phe Pro Ala Ser Ser  
85 90 95  
His Val Val Val Arg Ala Ile Pro Pro Ala Ala Thr Ala Ser Tyr Glu  
100 105 110  
Glu Leu Arg Ala Asp Val Gln Ala Ala Leu Asp Lys Leu Asn Arg Lys  
115 120 125  
Arg

<210> 25  
<211> 119  
<212> PRT  
<213> Chlamydia trachomatis

<400> 25  
Val His Arg Leu Thr Leu Pro Lys Ser Ala Arg Leu Leu Lys Arg Lys  
1 5 10 15  
Gln Phe Val Tyr Val Gln Arg Cys Gly Gln Tyr Cys Arg Thr Asp Gln  
20 25 30  
Ala Thr Leu Arg Ile Val Pro Ser Arg His Ser Asn Ile Arg Lys Val  
35 40 45  
Gly Val Thr Val Ser Lys Lys Phe Gly Lys Ala His Gln Arg Asn Arg  
50 55 60  
Phe Lys Arg Ile Val Arg Glu Ala Phe Arg His Val Arg Pro Asn Leu  
65 70 75 80  
Pro Ala Cys Gln Val Val Val Ser Pro Lys Gly Gly Thr Leu Pro Asn  
85 90 95  
Phe Gly Lys Leu Ser Ala Asp Leu Leu Lys His Ile Pro Glu Ala Leu  
100 105 110  
Pro Leu Val Thr Ser Ser Lys  
115

<210> 26  
<211> 122  
<212> PRT  
<213> Vibrio cholerae

<400> 26  
Ser Arg Ile Ile Leu Ser Thr Tyr Ala Phe Asn Arg Glu Leu Arg Leu  
1 5 10 15  
Leu Thr Pro Glu His Tyr Gln Lys Val Phe Gln Gln Ala His Ser Ala





Gly Asn Pro Ala Thr Gly Cys Arg Lys Gln Ala  
115 120

<210> 29  
<211> 113  
<212> PRT  
<213> Streptococcus pyogenes

<400> 29  
Val Lys Arg Glu Lys Asp Phe Gln Ala Ile Phe Lys Asp Gly Lys Ser  
1 5 10 15  
Thr Ala Asn Arg Lys Phe Val Ile Tyr His Leu Asn Arg Gly Gln Asp  
20 25 30  
His Phe Arg Val Gly Ile Ser Val Gly Lys Lys Ile Gly Asn Ala Val  
35 40 45  
Thr Arg Asn Ala Val Lys Arg Lys Ile Arg His Val Ile Met Ala Leu  
50 55 60  
Gly His Gln Leu Lys Ser Glu Asp Phe Val Val Ile Ala Arg Lys Gly  
65 70 75 80  
Val Glu Ser Leu Glu Tyr Gln Glu Leu Gln Gln Asn Leu His His Val  
85 90 95  
Leu Lys Leu Ala Gln Leu Leu Glu Lys Gly Phe Glu Ser Glu Glu Lys  
100 105 110  
His

<210> 30  
<211> 123  
<212> PRT  
<213> Bordetella pertussis

<400> 30  
Met Pro Arg Ala Thr Leu Pro Ala Glu Ala Arg Leu His Arg Pro Ser  
1 5 10 15  
Glu Phe Ala Ala Ala Leu Lys Gly Arg Arg Leu Ala Arg Gly Ala Phe  
20 25 30  
Phe Ile Val Ser Ala Ser Pro Cys Ala Pro Ala Asp Asp Gln Pro Ala  
35 40 45  
Arg Ala Arg Leu Gly Leu Val Ile Ala Lys Arg Phe Ala Ala Arg Ala  
50 55 60  
Val Thr Arg Asn Thr Leu Lys Arg Val Ile Arg Glu Ala Phe Arg Ala  
65 70 75 80  
Arg Arg Leu Ala Leu Pro Ala Gln Asp Tyr Val Val Arg Leu His Ser  
85 90 95  
Lys Leu Thr Pro Ala Ser Leu Thr Ala Leu Lys Arg Ser Ala Arg Ala  
100 105 110  
Glu Val Asp Ala His Phe Thr Arg Ile Ala Arg  
115 120

<210> 31  
<211> 137  
<212> PRT  
<213> Porphyromonas gingivalis

<400> 31  
Met Thr Ser Pro Pro Thr Phe Gly Leu Ser Lys Ser Glu Arg Leu Tyr

1		5		10		15									
Leu	Arg	Asp	Glu	Ile	Asn	Thr	Val	Phe	Gly	Glu	Gly	Lys	Ala	Phe	Val
	20			25				30							
Val	Tyr	Pro	Leu	Arg	Val	Val	Tyr	Arg	Leu	Gly	Ser	Glu	His	Arg	Val
	35			40				45							
Ala	Tyr	Ser	Ser	Met	Leu	Val	Ser	Val	Ala	Lys	Lys	Arg	Phe	Arg	Arg
	50			55				60							
Ala	Val	Lys	Arg	Asn	Arg	Val	Lys	Arg	Leu	Val	Arg	Glu	Ala	Tyr	Arg
65				70				75							80
Leu	Asn	Lys	His	Leu	Leu	Asn	Asp	Val	Leu	Gln	Glu	Arg	Gln	Ile	Tyr
	85			90				95							
Ala	Thr	Ile	Ala	Phe	Met	Val	Val	Ser	Asp	Glu	Leu	Pro	Asp	Phe	Arg
	100			105				110							
Thr	Val	Glu	Arg	Ala	Met	Gln	Lys	Ser	Leu	Ile	Arg	Ile	Ala	Gly	Asn
	115			120				125							
Val	Pro	Ser	Ser	Ala	Leu	Lys	Asn	Glu							
	130			135											

<210> 32  
 <211> 124  
 <212> PRT  
 <213> Streptococcus pneumoniae

<400> 32  
 Val Leu Lys Lys Asn Phe Arg Val Lys Arg Glu Lys Asp Phe Lys Ala  
 1 5 10 15  
 Ile Phe Lys Glu Gly Thr Ser Phe Ala Asn Arg Lys Phe Val Val Tyr  
 20 25 30  
 Gln Leu Glu Asn Gln Lys Asn Arg Phe Arg Val Gly Leu Ser Val Ser  
 35 40 45  
 Lys Lys Leu Gly Asn Ala Val Thr Arg Asn Gln Ile Lys Arg Arg Ile  
 50 55 60  
 Arg His Ile Ile Gln Asn Ala Lys Gly Ser Leu Val Glu Asp Val Asp  
 65 70 75 80  
 Phe Val Val Ile Ala Arg Lys Gly Val Glu Thr Leu Gly Tyr Ala Glu  
 85 90 95  
 Met Glu Lys Asn Leu Leu His Val Leu Lys Leu Ser Lys Ile Tyr Arg  
 100 105 110  
 Glu Gly Asn Gly Ser Glu Lys Glu Thr Lys Val Asp  
 115 120

<210> 33  
 <211> 114  
 <212> PRT  
 <213> Clostridium difficile

<400> 33  
 Met Asp Phe Asn Arg Thr Lys Gly Leu Lys Lys Asp Ser Asp Phe Arg  
 1 5 10 15  
 Lys Val Tyr Lys His Gly Lys Ser Phe Ala Asn Lys Tyr Leu Val Ile  
 20 25 30  
 Tyr Ile Leu Lys Asn Lys Ser Asp Tyr Ser Arg Val Gly Ile Ser Val  
 35 40 45  
 Ser Lys Lys Val Gly Lys Ala Ile Thr Arg Asn Arg Val Arg Arg Leu  
 50 55 60  
 Ile Lys Glu Ala Tyr Arg Leu Asn Ile Asp Glu Lys Ile Lys Pro Gly  
 65 70 75 80

Tyr Asp Ile Val Phe Ile Ala Arg Val Ser Ser Lys Asp Ala Thr Phe  
 85 90 95  
 Lys Asp Ile Asp Lys Ser Ile Lys Asn Leu Val Lys Arg Thr Asp Ile  
 100 105 110  
 Ser Ile

<210> 34  
 <211> 108  
 <212> PRT  
 <213> Camphylobacter jejuni

<400> 34  
 Val Lys Asn Phe Asp Lys Phe Ser Thr Asn Glu Glu Phe Ser Ser Val  
 1 5 10 15  
 Tyr Lys Val Gly Lys Lys Trp His Cys Glu Gly Val Ile Ile Phe Tyr  
 20 25 30  
 Leu Asn Ser Tyr Glu Lys Lys Ile Ala Val Val Ala Ser Lys Lys Val  
 35 40 45  
 Gly Lys Ala Val Val Arg Asn Arg Ser Lys Arg Ile Leu Arg Ala Leu  
 50 55 60  
 Phe Ala Lys Phe Glu Arg Tyr Leu Gln Asp Gly Lys Tyr Ile Phe Val  
 65 70 75 80  
 Ala Lys Asn Glu Ile Thr Glu Leu Ser Phe Ser Arg Leu Glu Lys Asn  
 85 90 95  
 Leu Lys Trp Gly Leu Lys Lys Leu Glu Cys Phe Lys  
 100 105

<210> 35  
 <211> 119  
 <212> PRT  
 <213> Bacillus anthracis

<400> 35  
 Met Lys Lys Lys His Arg Ile Lys Lys Asn Asp Glu Phe Gln Thr Val  
 1 5 10 15  
 Phe Gln Lys Gly Lys Ser Asn Ala Asn Arg Gln Phe Val Val Tyr Gln  
 20 25 30  
 Leu Asp Lys Glu Glu Gln Pro Asn Phe Arg Ile Gly Leu Ser Val Ser  
 35 40 45  
 Lys Lys Ile Gly Asn Ala Val Val Arg Asn Arg Ile Lys Arg Met Ile  
 50 55 60  
 Arg Gln Ser Ile Thr Glu Leu Lys Asp Glu Ile Asp Ser Gly Lys Asp  
 65 70 75 80  
 Phe Val Ile Ile Ala Arg Lys Pro Cys Ala Glu Met Thr Tyr Glu Glu  
 85 90 95  
 Leu Lys Lys Ser Leu Ile His Val Phe Lys Arg Ser Gly Met Lys Arg  
 100 105 110  
 Ile Lys Ser Ser Val Arg Lys  
 115

<210> 36  
 <211> 119  
 <212> PRT  
 <213> Mycobacterium avium

<400> 36  
 Val Leu Pro Ala Arg Asn Arg Met Thr Arg Ser Thr Glu Phe Asp Ala  
 1 5 10 15  
 Thr Val Lys His Gly Thr Arg Met Ala Gln Pro Asp Ile Val Val His  
 20 25 30  
 Leu Arg Arg Asp Ser Glu Pro Asp Asp Glu Ser Ala Gly Pro Arg Val  
 35 40 45  
 Gly Leu Val Val Gly Lys Ala Val Gly Thr Ala Val Gln Arg His Arg  
 50 55 60  
 Val Ala Arg Arg Leu Arg His Val Ala Arg Ala Leu Leu Gly Glu Leu  
 65 70 75 80  
 Glu Pro Ser Asp Arg Leu Val Ile Arg Ala Leu Pro Gly Ser Arg Thr  
 85 90 95  
 Ala Ser Ser Ala Arg Leu Ala Gln Glu Leu Gln Arg Cys Leu Arg Arg  
 100 105 110  
 Met Pro Ala Gly Thr Gly Pro  
 115

<210> 37  
 <211> 117  
 <212> PRT  
 <213> Staphylococcus aureus

<400> 37  
 Met Leu Leu Glu Lys Ala Tyr Arg Ile Lys Lys Asn Ala Asp Phe Gln  
 1 5 10 15  
 Arg Ile Tyr Lys Lys Gly His Ser Val Ala Asn Arg Gln Phe Val Val  
 20 25 30  
 Tyr Thr Cys Asn Asn Lys Glu Ile Asp His Phe Arg Leu Gly Ile Ser  
 35 40 45  
 Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile Lys Arg  
 50 55 60  
 Ala Ile Arg Glu Asn Phe Lys Val His Lys Ser His Ile Leu Ala Lys  
 65 70 75 80  
 Asp Ile Ile Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu  
 85 90 95  
 Gln Ile Gln Asn Ser Leu Glu His Val Leu Lys Ile Ala Lys Val Phe  
 100 105 110  
 Asn Lys Lys Ile Lys  
 115

<210> 38  
 <211> 117  
 <212> PRT  
 <213> Staphylococcus aureus

<400> 38  
 Met Leu Leu Glu Lys Ala Tyr Arg Ile Lys Lys Asn Ala Asp Phe Gln  
 1 5 10 15  
 Arg Ile Tyr Lys Lys Gly His Ser Val Ala Asn Arg Gln Phe Val Val  
 20 25 30  
 Tyr Thr Cys Asn Asn Lys Glu Ile Asp His Phe Arg Leu Gly Ile Ser  
 35 40 45  
 Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile Lys Arg  
 50 55 60  
 Ala Ile Arg Glu Asn Phe Lys Val His Lys Ser His Ile Leu Ala Lys  
 65 70 75 80

Asp Ile Ile Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu  
 85 90 95  
 Gln Ile Gln Asn Ser Leu Glu His Val Leu Lys Ile Ala Lys Val Phe  
 100 105 110  
 Asn Lys Lys Ile Lys  
 115

<210> 39  
 <211> 71  
 <212> PRT  
 <213> Escherichia coli

<400> 39  
 Leu Arg Leu Leu Thr Pro Ser Gln Phe Thr Phe Val Phe Arg Ile Gly  
 1 5 10 15  
 Leu Thr Val Ala Lys Lys Asn Val Arg Arg Ala His Glu Arg Asn Arg  
 20 25 30  
 Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu  
 35 40 45  
 Asp Phe Val Val Val Ala Lys Lys Gly Val Ala Asp Leu Asp Asn Arg  
 50 55 60  
 Ala Leu Ser Glu Ala Leu Glu  
 65 70

<210> 40  
 <211> 71  
 <212> PRT  
 <213> Proteus mirabilis

<400> 40  
 Leu Arg Leu Leu Thr Pro Lys His Phe Asn Phe Val Phe Arg Ile Gly  
 1 5 10 15  
 Leu Thr Ile Ala Lys Lys Asn Val Lys Arg Ala His Glu Arg Asn Arg  
 20 25 30  
 Ile Lys Arg Leu Ala Arg Glu Tyr Phe Arg Leu His Gln His Gln Leu  
 35 40 45  
 Asp Phe Val Val Leu Val Arg Lys Gly Val Ala Glu Leu Asp Asn His  
 50 55 60  
 Gln Leu Thr Glu Val Leu Gly  
 65 70

<210> 41  
 <211> 71  
 <212> PRT  
 <213> Haemophilus influenzae

<400> 41  
 Leu Arg Leu Leu Thr Pro Ile Gln Phe Lys Asn Val Phe Arg Leu Gly  
 1 5 10 15  
 Leu Thr Val Ala Lys Lys His Leu Lys Arg Ala His Glu Arg Asn Arg  
 20 25 30  
 Ile Lys Arg Leu Val Arg Glu Ser Phe Arg Leu Ser Gln His Arg Leu  
 35 40 45  
 Asp Phe Val Phe Val Ala Lys Asn Gly Ile Gly Lys Leu Asp Asn Asn  
 50 55 60  
 Thr Phe Ala Gln Ile Leu Glu

65

70

<210> 42  
 <211> 71  
 <212> PRT  
 <213> Pseudomonas putida

<400> 42  
 Lys Asn Leu Leu Thr Pro Arg His Phe Lys Ala Val Phe Arg Leu Gly  
 1 5 10 15  
 Leu Val Ile Gly Lys Lys Ser Val Lys Leu Ala Val Gln Arg Asn Arg  
 20 25 30  
 Leu Lys Arg Leu Met Arg Asp Ser Phe Arg Leu Asn Gln Gln Leu Leu  
 35 40 45  
 Asp Ile Val Ile Val Ala Arg Lys Gly Leu Gly Glu Ile Glu Asn Pro  
 50 55 60  
 Glu Leu His Gln His Phe Gly  
 65 70

<210> 43  
 <211> 71  
 <212> PRT  
 <213> Buchnera aphidicola

<400> 43  
 Ser Lys Leu Leu Lys Ser Thr Asn Phe Gln Tyr Val Phe Arg Leu Gly  
 1 5 10 15  
 Leu Ser Ile Ser Arg Lys Asn Ile Lys His Ala Tyr Arg Arg Asn Lys  
 20 25 30  
 Ile Lys Arg Leu Ile Arg Glu Thr Phe Arg Leu Leu Gln His Arg Leu  
 35 40 45  
 Asp Phe Val Val Ile Ala Lys Lys Asn Ile Val Tyr Leu Asn Asn Lys  
 50 55 60  
 Lys Ile Val Asn Ile Leu Glu  
 65 70

<210> 44  
 <211> 71  
 <212> PRT  
 <213> Salmonella typhi

<220>  
 <221> VARIANT  
 <222> 31  
 <223> Xaa = Any Amino Acid

<400> 44  
 Leu Arg Leu Leu Thr Pro Ala His Phe Thr Phe Val Phe Arg Ile Gly  
 1 5 10 15  
 Leu Thr Val Ala Lys Lys Asn Val Arg Arg Ala His Glu Arg Xaa Arg  
 20 25 30  
 Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu  
 35 40 45  
 Asp Phe Val Val Val Ala Lys Lys Gly Val Ala Asp Leu Asp Asn Arg  
 50 55 60  
 Ala Leu Ser Glu Ala Leu Glu

65

70

<210> 45  
 <211> 71  
 <212> PRT  
 <213> Yersinia pestis

<400> 45  
 Leu Arg Leu Leu Thr Pro Ser His Phe Thr Phe Val Phe Arg Ile Gly  
 1 5 10 15  
 Leu Thr Val Ala Lys Lys His Val Lys Arg Ala His Glu Arg Asn Arg  
 20 25 30  
 Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu His Gln His Ala Leu  
 35 40 45  
 Asp Phe Val Val Leu Val Lys Lys Gly Val Ala Asp Leu Asp Asn Arg  
 50 55 60  
 Ala Leu Thr Glu Ala Leu Glu  
 65 70

<210> 46  
 <211> 71  
 <212> PRT  
 <213> Klebsiella pneumoniae

<400> 46  
 Leu Arg Leu Leu Thr Pro Ser His Phe Thr Phe Val Phe Arg Ile Gly  
 1 5 10 15  
 Leu Thr Val Ala Lys Lys Asn Val Lys Arg Ala His Glu Arg Asn Arg  
 20 25 30  
 Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu  
 35 40 45  
 Asp Phe Val Val Val Ala Lys Arg Gly Val Ala Asp Leu Asp Asn Arg  
 50 55 60  
 Ala Leu Ser Glu Ala Leu Glu  
 65 70

<210> 47  
 <211> 66  
 <212> PRT  
 <213> Salmonella paratyphi

<400> 47  
 Ile Arg Leu Pro Ala Thr Ser Thr Arg Ile Gly Leu Thr Val Ala Lys  
 1 5 10 15  
 Lys Asn Val Arg Arg Ala His Glu Arg Asn Arg Ile Lys Arg Leu Thr  
 20 25 30  
 Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu Asp Phe Val Val Val  
 35 40 45  
 Ala Lys Lys Gly Val Ala Asp Leu Asp Asn Arg Ala Leu Ser Glu Ala  
 50 55 60  
 Leu Glu  
 65

<210> 48  
 <211> 71



<212> PRT  
<213> *Vibrio cholerae*

<400> 48  
Leu Arg Leu Leu Thr Pro Glu His Tyr Gln Lys Val Phe Arg Leu Gly  
1 5 10 15  
Leu Ala Val Pro Lys Lys Gln Ile Lys Thr Ala Val Gly Arg Asn Arg  
20 25 30  
Phe Lys Arg Ile Cys Arg Glu Ser Phe Arg Leu His Gln Asn Gln Leu  
35 40 45  
Asp Phe Val Val Ile Ala Lys Lys Ser Ala Gln Asp Leu Ser Asn Glu  
50 55 60  
Glu Leu Phe Asn Leu Leu Gly  
65 70

<210> 49  
<211> 71  
<212> PRT  
<213> *Pseudomonas aeruginosa*

<400> 49  
Lys Arg Leu Leu Thr Ala Arg Gln Phe Ser Ala Val Phe Arg Leu Gly  
1 5 10 15  
Leu Val Ile Gly Lys Lys Asn Val Lys Leu Ala Val Gln Arg Asn Arg  
20 25 30  
Leu Lys Arg Leu Ile Arg Glu Ser Phe Arg His Asn Gln Glu Thr Leu  
35 40 45  
Asp Ile Val Val Ile Ala Arg Lys Gly Leu Gly Glu Leu Glu Asn Pro  
50 55 60  
Glu Leu His Gln Gln Phe Gly  
65 70

<210> 50  
<211> 71  
<212> PRT  
<213> *Shewanella putrefaciens*

<400> 50  
Leu Arg Leu Leu Thr Pro Ala Gln Phe Lys Ser Val Phe Arg Leu Gly  
1 5 10 15  
Leu Thr Val Ala Lys Arg Tyr Val Lys Arg Ala Asn Gln Arg Asn Arg  
20 25 30  
Ile Lys Arg Val Ile Arg Asp Ser Phe Arg Leu Asn Gln His Asn Ile  
35 40 45  
Asp Ile Val Val Leu Val Arg Asn Gly Val Met Glu Met Glu Asn Ala  
50 55 60  
Glu Leu Asn Gly Leu Ile Glu  
65 70

<210> 51  
<211> 71  
<212> PRT  
<213> *Coxiella burnetii*

<400> 51  
Trp Arg Ile Arg Thr Thr Ala Glu Phe Arg Arg Ile Tyr Arg Leu Gly

1 5 10 15  
 Val Val Ala Ser Lys Arg Asn Val Arg Lys Ala Val Trp Arg Asn Arg  
 20 25 30  
 Val Arg Arg Val Val Lys Glu Ala Phe Arg Ile Arg Lys Lys Asp Leu  
 35 40 45  
 Asp Ile Val Val Val Ala Lys Ala Ser Ser Val Glu Ala Asp Asn Lys  
 50 55 60  
 Glu Leu Tyr Glu Cys Ile Asn  
 65 70

<210> 52  
 <211> 70  
 <212> PRT  
 <213> Rickettsia prowazekii

<400> 52  
 Thr Ser Leu Lys Asn Gln Lys Glu Phe Glu Leu Ile Asn Leu Gly Ile  
 1 5 10 15  
 Lys Val Ser Arg Lys Leu Asn Lys Lys Ala Val Val Arg Asn Lys Ile  
 20 25 30  
 Lys Arg Arg Ile Arg His Leu Met Arg Ile Ile Val Asn Asp Ser Ala  
 35 40 45  
 Ile Ile Ile Ile Pro Lys Lys Gly Phe Glu Glu Ile Asn Phe Ser His  
 50 55 60  
 Leu Gln Tyr Glu Leu Ser  
 65 70

<210> 53  
 <211> 73  
 <212> PRT  
 <213> Caulobacter crescentus

<400> 53  
 Glu Arg Leu Arg Lys Arg Pro Asp Phe Leu Leu Ala Ala Arg Val Gly  
 1 5 10 15  
 Phe Thr Ala Thr Lys Lys Ile Gly Gly Ala Val Glu Arg Asn Arg Ala  
 20 25 30  
 Lys Arg Arg Leu Arg Glu Ala Ala Arg Leu Val Leu Pro Leu Asp Tyr  
 35 40 45  
 Val Phe Ile Ala Arg Gly Gly Thr Gly Thr Arg Glu Trp Ala Arg Leu  
 50 55 60  
 Leu Asp Asp Val Lys Thr Ala Leu Ile  
 65 70

<210> 54  
 <211> 74  
 <212> PRT  
 <213> Helicobacter pylori 26695

<400> 54  
 Asp Ser Leu Lys Asn Lys Ser Glu Phe Asp Arg Val Tyr Lys Leu Gly  
 1 5 10 15  
 Leu Ser Val Ser Lys Lys Val Gly Asn Ala Val Lys Arg Asn Leu Ile  
 20 25 30  
 Lys Arg Arg Leu Arg Ser Leu Thr Leu Lys His Ala Ala Leu Cys Ala  
 35 40 45

Leu Val Phe Val Pro Arg Ser Asp Cys Tyr His Leu Asp Phe Trp Ala  
 50 55 60  
 Leu Glu Lys His Phe Leu Glu Met Leu Thr  
 65 70

<210> 55  
 <211> 74  
 <212> PRT  
 <213> Helicobacter pylori J99

<400> 55  
 Asp Ser Leu Lys Asn Lys Ser Glu Phe Asp Arg Val Tyr Lys Leu Gly  
 1 5 10 15  
 Leu Ser Val Ser Lys Lys Val Gly Asn Ala Val Lys Arg Asn Leu Ile  
 20 25 30  
 Lys Arg Arg Leu Arg Ser Leu Val Thr Arg His Ala Ala Leu Cys Ala  
 35 40 45  
 Leu Val Phe Val Pro Arg Ser Asp Cys Tyr His Leu Asp Phe Trp Ala  
 50 55 60  
 Leu Glu Lys His Phe Leu Glu Met Leu Thr  
 65 70

<210> 56  
 <211> 74  
 <212> PRT  
 <213> Campylobacter jejuni

<400> 56  
 Asp Lys Phe Ser Thr Asn Glu Glu Phe Ser Ser Val Tyr Lys Ile Ala  
 1 5 10 15  
 Val Val Ala Ser Lys Lys Val Gly Lys Ala Val Val Arg Asn Arg Ser  
 20 25 30  
 Lys Arg Ile Leu Arg Ala Leu Phe Ala Lys Phe Glu Arg Tyr Leu Lys  
 35 40 45  
 Tyr Ile Phe Val Ala Lys Asn Glu Ile Thr Glu Leu Ser Phe Ser Arg  
 50 55 60  
 Leu Glu Lys Asn Leu Lys Trp Gly Leu Lys  
 65 70

<210> 57  
 <211> 71  
 <212> PRT  
 <213> Neisseria gonorrhoeae

<400> 57  
 Tyr Arg Leu Leu Lys Thr Asp Asp Phe Ser Ser Val Phe Arg Ile Gly  
 1 5 10 15  
 Leu Val Val Gly Lys Lys Thr Ala Lys Arg Ala Asn Glu Arg Asn Tyr  
 20 25 30  
 Met Lys Arg Val Ile Arg Asp Trp Phe Arg Leu Asn Lys Asn Arg Leu  
 35 40 45  
 Asp Phe Val Val Arg Val Arg Arg Lys Phe Asp Arg Ala Thr Ala Lys  
 50 55 60  
 Gln Ala Arg Ala Glu Leu Ala  
 65 70

Sub  
C1  
cont  
  
B/D  
cont

<210> 58  
<211> 71  
<212> PRT  
<213> Neisseria meningitidis

<400> 58  
Tyr Arg Leu Leu Lys Thr Asp Asp Phe Ser Ser Val Phe Arg Ile Gly  
1 5 10 15  
Leu Val Val Gly Glu Lys Thr Ala Lys Arg Ala Asn Glu Arg Asn Tyr  
20 25 30  
Met Lys Arg Val Ile Arg Asp Trp Phe Arg Leu Asn Lys Asn Arg Leu  
35 40 45  
Asp Phe Val Val Arg Val Arg Arg Lys Phe Asp Arg Ala Thr Ala Lys  
50 55 60  
Gln Ala Arg Ala Glu Leu Ala  
65 70

<210> 59  
<211> 75  
<212> PRT  
<213> Bordetella pertussis

<400> 59  
Ala Arg Leu His Arg Pro Ser Glu Phe Ala Ala Ala Leu Arg Leu Gly  
1 5 10 15  
Leu Val Ile Ala Lys Arg Phe Ala Ala Arg Ala Val Thr Arg Asn Thr  
20 25 30  
Leu Lys Arg Val Ile Arg Glu Ala Phe Arg Ala Arg Arg Leu Ala Leu  
35 40 45  
Asp Tyr Val Val Arg Leu His Ser Lys Leu Thr Pro Ala Ser Leu Thr  
50 55 60  
Ala Leu Lys Arg Ser Ala Arg Ala Glu Val Asp  
65 70 75

<210> 60  
<211> 70  
<212> PRT  
<213> Thiobacillus ferrooxidans

<400> 60  
Asp Arg Leu Arg Gln Lys Val Ala Ile Gln Arg Thr Leu Arg Leu Gly  
1 5 10 15  
Leu Ala Val Ser Arg Lys Val Gly Asn Ala Val Val Arg Asn Arg Ile  
20 25 30  
Lys Arg Arg Leu Arg Glu Ala Phe Arg Gln Gln Ser Val Arg Thr Asp  
35 40 45  
Val Leu Val Val Ala Arg Pro Ser Ala Arg Gln Leu Ser Met Arg Ala  
50 55 60  
Met Gly Ala Tyr Leu Gln  
65 70

<210> 61  
<211> 70  
<212> PRT  
<213> Streptomyces bikiniensis

<400> 61  
 Asn Arg Leu Arg Arg Arg Glu Asp Phe Ala Thr Ala Val Arg Ala Gly  
 1 5 10 15  
 Phe Val Val Ser Lys Ala Val Gly Gly Ala Val Val Arg Asn Gln Val  
 20 25 30  
 Lys Arg Arg Leu Lys His Leu Val Cys Asp Arg Leu Ser Ala Leu Leu  
 35 40 45  
 Val Val Val Arg Ala Leu Pro Gly Ala Gly Asp Ala Asp His Ala Gln  
 50 55 60  
 Leu Ala Arg Asp Leu Asp  
 65 70

<210> 62  
 <211> 70  
 <212> PRT  
 <213> Streptomyces coelicolor

<400> 62  
 Asn Arg Leu Arg Arg Arg Glu Asp Phe Ala Thr Ala Val Arg Ala Gly  
 1 5 10 15  
 Phe Val Val Ser Lys Ala Val Gly Val Ala Val Val Arg Asn Lys Val  
 20 25 30  
 Lys Arg Arg Leu Arg His Leu Met Arg Asp Arg Ile Asp Leu Leu Leu  
 35 40 45  
 Val Val Val Arg Ala Leu Pro Gly Ala Gly Asp Ala Asp His Ala Gln  
 50 55 60  
 Leu Ala Arg Asp Leu Asp  
 65 70

<210> 63  
 <211> 74  
 <212> PRT  
 <213> Micrococcus luteus

<400> 63  
 Arg Arg Val Arg Thr Pro Ala Glu Phe Arg His Leu Gly Arg Ala Gly  
 1 5 10 15  
 Phe Val Val Ser Lys Ala Val Gly Asn Ala Val Thr Arg Asn Arg Val  
 20 25 30  
 Lys Arg Arg Leu Arg Ala Val Val Ala Glu Gln Met Arg Leu Val Leu  
 35 40 45  
 Val Gln Val Arg Ala Leu Pro Ala Ala Ala Glu Ala Asp Tyr Ala Leu  
 50 55 60  
 Leu Arg Arg Glu Thr Val Gly Ala Leu Gly  
 65 70

<210> 64  
 <211> 71  
 <212> PRT  
 <213> Mycobacterium tuberculosis

<400> 64  
 Asn Arg Met Arg Arg Ser Ala Asp Phe Glu Thr Thr Val Arg Val Gly  
 1 5 10 15  
 Leu Ile Ile Ala Lys Ser Val Gly Ser Ala Val Glu Arg His Arg Val  
 20 25 30

Ala Arg Arg Leu Arg His Val Ala Gly Ser Ile Val Lys Glu Leu Asp  
 35 40 45  
 His Val Val Ile Arg Ala Leu Pro Ser Ser Arg His Val Ser Ser Ala  
 50 55 60  
 Arg Leu Glu Gln Gln Leu Arg  
 65 70

<210> 65  
 <211> 71  
 <212> PRT  
 <213> Mycobacterium leprae

<400> 65  
 Asn Arg Met Arg Arg Ser Ser Glu Phe Asp Ala Thr Val His Val Gly  
 1 5 10 15  
 Leu Ile Ile Ala Lys Thr Val Gly Ser Ala Val Glu Arg His Arg Val  
 20 25 30  
 Ala Arg Arg Leu Arg His Val Ala Arg Thr Met Leu Gly Glu Leu Asp  
 35 40 45  
 Gln Val Val Ile Arg Ala Leu Pro Ser Ser Arg Asn Val Ser Ser Ala  
 50 55 60  
 Trp Leu Ala Gln Gln Leu Arg  
 65 70

<210> 66  
 <211> 71  
 <212> PRT  
 <213> Mycobacterium bovis

<400> 66  
 Asn Arg Met Arg Arg Ser Ala Asp Phe Glu Thr Thr Val Arg Val Gly  
 1 5 10 15  
 Leu Ile Ile Ala Lys Ser Val Gly Ser Ala Val Glu Arg His Arg Val  
 20 25 30  
 Ala Arg Arg Leu Arg His Val Ala Gly Ser Ile Val Lys Glu Leu Asp  
 35 40 45  
 His Val Val Ile Arg Ala Leu Pro Ser Ser Arg His Val Ser Ser Ala  
 50 55 60  
 Arg Leu Glu Gln Gln Leu Arg  
 65 70

<210> 67  
 <211> 71  
 <212> PRT  
 <213> Mycobacterium avium

<400> 67  
 Asn Arg Met Thr Arg Ser Thr Glu Phe Asp Ala Thr Val Arg Val Gly  
 1 5 10 15  
 Leu Val Val Gly Lys Ala Val Gly Thr Ala Val Gln Arg His Arg Val  
 20 25 30  
 Ala Arg Arg Leu Arg His Val Ala Arg Ala Leu Leu Gly Glu Leu Asp  
 35 40 45  
 Arg Leu Val Ile Arg Ala Leu Pro Gly Ser Arg Thr Ala Ser Ser Ala  
 50 55 60  
 Arg Leu Ala Gln Glu Leu Gln

Sub  
 C1  
 cont

B10  
 cont

65

70

<210> 68  
 <211> 50  
 <212> PRT  
 <213> Corynebacterium diphtheriae

<400> 68  
 His Lys Leu Ser Gln Phe Arg Ala Thr Ile Arg Phe Gly Leu Val Val  
 1 5 10 15  
 Ser Lys Ala Val Gly Asn Ala Val Thr Arg His Arg Val Ser Arg Gln  
 20 25 30  
 Leu Arg His Phe His Val Val Glu Leu Arg Ala Asp Val Gln Ala Ala  
 35 40 45  
 Leu Asp  
 50

<210> 69  
 <211> 3  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Synthetic

<400> 69  
 Lys Asn Glu  
 1

<210> 70  
 <211> 8  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Synthetic

<400> 70  
 Ala Phe Leu Glu Glu Lys Glu Arg  
 1 5

<210> 71  
 <211> 8  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Synthetic

<400> 71  
 Ile Ala Arg Lys Pro Ala Ser Gln  
 1 5

<210> 72

<211> 4  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 72  
Leu Thr Tyr Glu  
1

<210> 73  
<211> 70  
<212> PRT  
<213> Bacillus subtilis

<400> 73  
Asn Arg Leu Lys Arg Ser Asp Asp Phe Arg Lys Val Phe Arg Val Gly  
1 5 10 15  
Leu Ser Val Ser Lys Lys Ile Gly Asn Ala Val Met Arg Asn Arg Ile  
20 25 30  
Lys Arg Leu Ile Arg Gln Phe Phe Gln Glu His Glu Gln Ala Leu Asp  
35 40 45  
Tyr Ile Ile Ile Ala Arg Lys Pro Ala Ala Asp Met Thr Tyr Glu Glu  
50 55 60  
Thr Lys Lys Ser Leu Gln  
65 70

<210> 74  
<211> 69  
<212> PRT  
<213> Bacillus halodurans

<400> 74  
His Arg Ile Lys Lys Asn Asp Glu Phe Ser Arg Val Phe Arg Val Leu  
1 5 10 15  
Ser Val Ser Lys Lys Ile Gly Asn Ala Val Thr Arg Asn Arg Val Lys  
20 25 30  
Arg Leu Ile Arg Thr Ser Ile Thr Glu Leu Lys Asp Glu Ile Asp Tyr  
35 40 45  
Val Ile Ile Ala Arg Lys Pro Cys Ala Glu Met Thr Tyr Glu Gln Val  
50 55 60  
Lys Gly Ser Leu Trp  
65

<210> 75  
<211> 70  
<212> PRT  
<213> Bacillus anthracis

<400> 75  
His Arg Ile Lys Lys Asn Phe Glu Phe Gln Thr Val Phe Arg Ile Gly  
1 5 10 15  
Leu Ser Val Ser Lys Lys Ile Gly Asn Ala Val Val Arg Asn Arg Ile  
20 25 30  
Lys Arg Met Ile Arg Gln Ile Leu Lys Gln Asn Ile Ser Glu Ile Asp



35 40 45  
 Phe Val Ile Leu Val Arg Lys Ser Val Leu Glu Leu Lys Tyr Ala Glu  
 50 55 60  
 Leu Lys Lys Ser Leu Ile  
 65 70

<210> 76  
 <211> 70  
 <212> PRT  
 <213> Mycoplasma capricolum

<400> 76  
 Arg Val Ile Lys Asp Arg Lys Glu Phe Gln Glu Ile Ile Lys Tyr Gly  
 1 5 10 15  
 Ile Ser Val Gly Lys Lys Ile Gly Asn Ala Val Ile Arg Asn Lys Val  
 20 25 30  
 Lys Arg Gln Ile Arg Met Ile Met Arg Glu Gln Phe Cys Asn Ile Asp  
 35 40 45  
 Ile Ile Ile Ile Ile Asn Gln Gly Phe Leu Glu Leu Thr Phe Lys Thr  
 50 55 60  
 Leu Ser Lys Leu Leu Ile  
 65 70

<210> 77  
 <211> 71  
 <212> PRT  
 <213> Mycoplasma pneumoniae

<400> 77  
 His His Leu Arg Glu Arg Lys Val Phe Ala Ala Leu Leu Arg Ala Ala  
 1 5 10 15  
 Val Ser Ile Ser Lys Thr Lys Tyr Lys Leu Ala Val Glu Arg Asn Leu  
 20 25 30  
 Ile Arg Arg Gln Val Lys Ala Ile Phe Gln Gln Ile Ser Asn Asn Leu  
 35 40 45  
 Asp Val Leu Val Ile Val Asn Lys Gly Phe Ile Glu Leu Thr Phe Lys  
 50 55 60  
 Glu Lys Gln Thr Ile Phe Leu  
 65 70

<210> 78  
 <211> 71  
 <212> PRT  
 <213> Mycoplasma genitalium

<400> 78  
 His Ser Leu Arg Arg Glu Lys Val Phe Thr Thr Ile Leu Arg Val Ala  
 1 5 10 15  
 Ile Ser Ile Ala Lys Thr Lys Tyr Lys Leu Ala Val Gln Arg Asn Leu  
 20 25 30  
 Ile Lys Arg Gln Ile Arg Ser Val Ile Met Ala Leu Gly His Gln Leu  
 35 40 45  
 Asp Ile Leu Val Ile Ala Arg Lys Gly Val Glu Ser Leu Glu Tyr Gln  
 50 55 60  
 Glu Lys Gln Lys Leu Phe Leu  
 65 70

<210> 79  
<211> 68  
<212> PRT  
<213> Streptococcus pyogenes

<400> 79  
Val Lys Ser Asp Lys Asp Phe Gln Ala Ile Phe Arg Val Gly Ile Ser  
1 5 10 15  
Val Gly Lys Lys Ile Gly Asn Ala Val Thr Arg Asn Ala Val Lys Arg  
20 25 30  
Lys Ile Arg His Val Leu Met Glu Leu Gly Pro Tyr Leu Asp Phe Val  
35 40 45  
Val Ile Ala Arg Lys Gly Val Glu Glu Leu Asp Tyr Ser Glu Leu Gln  
50 55 60  
Gln Asn Leu His  
65

<210> 80  
<211> 70  
<212> PRT  
<213> Streptococcus mutans

<400> 80  
Tyr Arg Val Lys Arg Glu Lys Asp Phe Gln Ala Ile Phe Arg Val Gly  
1 5 10 15  
Leu Ser Val Gly Lys Arg Leu Gly Asn Ala Val Val Arg Asn Ala Ile  
20 25 30  
Lys Arg Lys Leu Arg His Ile Ile Gln Asn Ala Lys Gly Ser Leu Asp  
35 40 45  
Phe Val Val Ile Ala Arg Lys Gly Val Glu Thr Leu Gly Tyr Ala Thr  
50 55 60  
Met Lys Lys Asn Leu Val  
65 70

<210> 81  
<211> 70  
<212> PRT  
<213> Streptococcus pneumoniae

<400> 81  
Phe Arg Val Lys Lys Asn Ala Asp Phe Lys Ala Ile Phe Arg Val Gly  
1 5 10 15  
Leu Ser Val Ser Lys Lys Leu Gly Asn Ala Val Thr Arg Asn Gln Ile  
20 25 30  
Lys Arg Arg Ile Arg His Asn Phe Lys Val His Lys Ser His Leu Asp  
35 40 45  
Phe Val Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu Glu  
50 55 60  
Met Glu Lys Asn Leu Leu  
65 70

<210> 82  
<211> 70  
<212> PRT  
<213> Staphylococcus aureus NCTC

<400> 82  
 Tyr Arg Ile Lys Lys Asn Ala Asp Phe Gln Arg Ile Tyr Arg Leu Gly  
 1 5 10 15  
 Ile Ser Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile  
 20 25 30  
 Lys Arg Ala Ile Arg Glu Asn Phe Lys Val His Lys Ser His Ile Asp  
 35 40 45  
 Ile Ile Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu Gln  
 50 55 60  
 Ile Gln Asn Ser Leu Glu  
 65 70

<210> 83  
 <211> 70  
 <212> PRT  
 <213> Staphylococcus aureus COL

<400> 83  
 Tyr Arg Ile Lys Lys Asp Ser Asp Phe Gln Arg Ile Tyr Arg Leu Gly  
 1 5 10 15  
 Ile Ser Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile  
 20 25 30  
 Lys Arg Ala Ile Arg Glu Ala Tyr Arg Leu Asn Ile Asp Glu Lys Ile  
 35 40 45  
 Asp Ile Ile Val Ile Ala Arg Val Ser Ser Lys Asp Ile Asp Lys Gln  
 50 55 60  
 Ile Gln Asn Ser Leu Glu  
 65 70

<210> 84  
 <211> 70  
 <212> PRT  
 <213> Clostridium difficile

<400> 84  
 Lys Gly Leu Lys Asn Ser Glu Asp Phe Arg Lys Val Tyr Arg Val Gly  
 1 5 10 15  
 Ile Ser Val Ser Lys Lys Val Gly Lys Ala Ile Thr Arg Asn Arg Val  
 20 25 30  
 Arg Arg Leu Ile Lys Glu Val Val Ile Ala Met Lys Asp Gln Ile Asp  
 35 40 45  
 Ile Val Phe Val Arg Ala Ile Pro Pro Ala Ala Thr Ala Ser Tyr Glu  
 50 55 60  
 Ser Ile Lys Asn Leu Val  
 65 70

<210> 85  
 <211> 71  
 <212> PRT  
 <213> Synechocystis PCC6803

<400> 85  
 Leu Arg Leu Lys His Trp Gln Asp Phe Gln Thr Val Tyr Arg Phe Gly  
 1 5 10 15  
 Ile Thr Val Ser Gln Lys Val Ser Lys Lys Ala Thr Val Arg Asn Arg  
 20 25 30

Leu Lys Arg Gln Ile Arg Ala Val Ile Asn His Phe Gln Pro Gln Ile  
 35 40 45  
 Asp Val Val Ile Ile Val Leu Pro Gln Gly Ile Gly Cys Asn Tyr Glu  
 50 55 60  
 Arg Phe Leu Arg Glu Leu Glu  
 65 70

<210> 86  
 <211> 71  
 <212> PRT  
 <213> Pseudanabaena PCC6903

<400> 86  
 Asn Arg Leu Arg Arg Arg Glu Asp Phe Ala Lys Val Tyr Arg Ile Gly  
 1 5 10 15  
 Ile Val Val Ser Lys Lys Val Ser Lys Leu Ala Val Thr Arg Asn Arg  
 20 25 30  
 Phe Lys Arg Gln Leu Arg Ala Ile Phe Arg Gln Leu Leu Ser Gln Leu  
 35 40 45  
 Gln Ile Val Val Thr Val Thr Thr Val Ala Ser Lys Pro Asn Tyr Gln  
 50 55 60  
 Glu Leu Gly Asp Asp Leu Lys  
 65 70

<210> 87  
 <211> 70  
 <212> PRT  
 <213> Borrelia burgdorferi

<400> 87  
 Ile Ser Leu Lys Ser Lys Ile Glu Ile Gln Lys Ile Phe Arg Ile Leu  
 1 5 10 15  
 Val Thr Phe Ser Lys Gly Phe Arg Gly Ser Val Lys Arg Asn Arg Ile  
 20 25 30  
 Arg Arg Leu Phe Lys Glu Ala Phe Arg Lys Arg Leu Glu Leu Leu Asp  
 35 40 45  
 Ile Ile Phe Val Val Ser Tyr Gly Lys Leu Thr Leu Thr Tyr Phe Ser  
 50 55 60  
 Ile Glu Ser Leu Met Lys  
 65 70

<210> 88  
 <211> 71  
 <212> PRT  
 <213> Treponema pallidum

<400> 88  
 Glu Arg Leu Arg Gly Ser Cys Arg Val Arg Ala Val Phe Arg Phe Leu  
 1 5 10 15  
 Ala Thr Phe Arg Arg Gly Tyr Gly Lys Ala Val Ala Arg Asn Arg Ala  
 20 25 30  
 Arg Arg Leu Ser Lys Glu Ala Tyr Arg Ala Leu Lys Ser Ser Leu Asp  
 35 40 45  
 Leu Val Leu Leu Val Ser Val Val Glu Asp Ser Leu Ala Ala Tyr Gln  
 50 55 60  
 Arg Leu Leu Cys Val Leu Cys

65

70

<210> 89  
 <211> 73  
 <212> PRT  
 <213> Chlamydia trachomatis

<400> 89  
 Ala Arg Leu Leu Lys Arg Lys Gln Phe Val Tyr Val Gln Lys Val Gly  
 1 5 10 15  
 Ile Thr Val Ser Lys Lys Phe Gly Lys Ala His Gln Arg Asn Arg Phe  
 20 25 30  
 Lys Arg Ile Val Arg Glu Ala Phe Arg His Val Arg Pro Asn Leu Gln  
 35 40 45  
 Val Val Ile Ser Pro Arg Gly Asn Ser Gln Pro Asp Phe Leu Lys Leu  
 50 55 60  
 Ser Glu Glu Leu Leu Gln Arg Ile Pro  
 65 70

<210> 90  
 <211> 73  
 <212> PRT  
 <213> Chlamydia trachomatis MoPn

<400> 90  
 Ala Arg Leu Leu Lys Arg Lys Gln Phe Val Tyr Val Gln Lys Val Gly  
 1 5 10 15  
 Val Thr Val Ser Lys Lys Phe Gly Lys Ala His Gln Arg Asn Arg Phe  
 20 25 30  
 Lys Arg Ile Val Arg Glu Ala Phe Arg His Val Arg Pro Asn Leu Gln  
 35 40 45  
 Val Val Val Ser Pro Lys Gly Thr Leu Pro Asn Phe Gly Lys Leu  
 50 55 60  
 Ser Ala Asp Leu Leu Lys His Ile Pro  
 65 70

<210> 91  
 <211> 74  
 <212> PRT  
 <213> Chlamydia pneumoniae

<400> 91  
 Ser Arg Val Leu Lys Arg Lys Gln Phe Leu Tyr Ile Thr Arg Met Gly  
 1 5 10 15  
 Ile Thr Val Ser Lys Lys Phe Gly Lys Ala His Glu Arg Asn Ser Phe  
 20 25 30  
 Lys Arg Val Val Arg Glu Val Phe Arg His Val Arg His Gln Leu Gln  
 35 40 45  
 Ile Val Val Phe Pro Lys Gly His Lys Gln Arg Pro Val Phe Ser Lys  
 50 55 60  
 Leu Leu Gln Asp Phe Ile Asn Gln Ile Pro  
 65 70

<210> 92  
 <211> 74

<212> PRT

<213> Thermotoga maritima

<400> 93

Glu Arg Leu Arg Leu Arg Arg Asp Phe Leu Leu Ile Phe Arg Leu Gly  
1 5 10 15  
Ile Val Val Lys Arg Lys Phe Gly Lys Ala Thr Arg Arg Asn Lys Leu  
20 25 30  
Lys Arg Trp Val Arg Glu Ile Phe Arg Arg Asn Lys Gly Val Ile Asp  
35 40 45  
Ile Val Val Ile Pro Arg Lys Lys Leu Ser Glu Glu Phe Glu Arg Val  
50 55 60  
Asp Phe Trp Thr Val Arg Glu Lys Leu Leu  
65 70

<210> 93

<211> 78

<212> PRT

<213> Porphyromonas gingivalis

<400> 93

Glu Arg Leu Tyr Leu Arg Asp Glu Ile Asn Thr Val Phe Ser Met Leu  
1 5 10 15  
Val Ser Val Ala Lys Lys Arg Phe Arg Arg Ala Val Lys Arg Asn Arg  
20 25 30  
Val Arg Arg Leu Val Arg Glu Ala Tyr Arg Leu Asn Lys His Leu Leu  
35 40 45  
Asp Val Leu Gln Glu Arg Gln Ile Tyr Ala Thr Ile Ala Phe Met Val  
50 55 60  
Val Ser Asp Glu Leu Pro Asp Phe Arg Thr Val Glu Arg Ala  
65 70 75

<210> 94

<211> 77

<212> PRT

<213> Deinococcus radiodurans

<400> 94

Leu Arg Gly Glu Arg Glu Phe Arg Lys Val Arg Arg Ile Gly Leu Val  
1 5 10 15  
Val Ser Lys Lys Thr Leu Lys His Ala Val Lys Arg Asn Arg Ala Arg  
20 25 30  
Arg Arg Val Arg Glu Ala Leu Arg Thr Met Pro Pro Glu Leu Arg Ala  
35 40 45  
Ile Leu Met Leu Asn Pro Gly Val Leu Thr Val Pro Phe Pro Glu Leu  
50 55 60  
Gln Ala Ala Leu Ala Gln Ala Leu Gln Arg Gly Ala Gly  
65 70 75

<210> 95

<211> 75

<212> PRT

<213> Chlorobium tepidum

<400> 95

Ala Arg Leu Lys Gly Gly Phe Leu Leu Leu Ile Arg Val Leu Phe Thr

1 5 10 15  
 Val Gly Lys ~~Lys~~ Leu Val Pro Arg Ala Val Asp Arg Asn Arg Ile Lys  
 20 25 30  
 Arg Leu Met Arg Glu Ala Tyr Arg Leu Glu Lys Asn Ile Leu Asp His  
 35 40 45  
 Gln Val Met Leu Ala Phe Leu Tyr Arg Ala Arg Ala Asp Ala Ile Pro  
 50 55 60  
 Ser Leu Glu Arg Phe Arg Ala Ile Arg His Met  
 65 70 75